## REMARKS/ARGUMENTS

Claims 1, 3-5, 7, 9, 10, 14, and 16-28 are pending in this application. By this Amendment, Applicant AMENDS claims 1, 3, 7, 9, and 19-21; CANCELS claims 2, 6, 8, 11-13, and 15; and ADDS claims 22-28.

Support for new claims 22-25 can be found in, for example, Applicant's original claims 3-5 and 10. Support for new claim 26 can be found on, for example, page 5, lines 29-30 of Applicant's specification. Support for new claim 27 can be found on, for example, page 3, lines 20-22 of Applicant's specification. Support for new claim 28 can be found on, for example, page 7, lines 25-30 of Applicant's specification.

Claims 9, 10, and 14 were rejected under 35 U.S.C. § 102(b) as being anticipated by Young (U.S. 2003/0081096). Claims 1-5 and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Young in view of Temple (U.S. 2003/0067527). Claims 6 and 16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Young and Temple in view of Onishi et al. (U.S. 2001/0015745). Claims 7 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Young and Temple in view of Kasperchik et al. (U.S. 6,536,878). Claims 8 and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Young and Temple in view of Lin et al. (U.S. 5,531,818). Claims 11 and 19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Young in view of Onishi et al. Claims 12 and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Young in view of Kasperchik et al. Claims 13 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Young in view of Lin et al.

Applicant respectfully traverses the rejections of claims 1, 3-5, 7, 9, 10, 14, and 16-21.

Claim 1 has been amended to recite:

> A single pass progressive dot printing ink-jet process comprising the steps of:
>
> applying a first UV curable ink drop to a substrate;
>
> applying a second UV curable ink drop onto the first UV curable ink drop without intermediate solidification of the first UV curable ink drop; and

> subsequently applying UV curable ink drops to the combined first and second UV curable ink drops without intermediate solidification of the first and subsequent UV curable ink drops; wherein
>
> **a viscosity of the first to the additional UV curable ink drops applied varies in a graduated manner within a range of from 10 up to 30 mPa·s or a range of from 30 down to 10 mPa·s**; and
>
> **a curing speed of the first to the additional UV curable ink drops applied varies in a graduated manner within a range of from 20 up to 70 m/min or a range of from 70 down to 20 m/min**. (emphasis added)

Applicant's claims 9, 16, 18, 19, and 21 recite features and/or method steps that are similar to the features and method steps recited in Applicant's claim 1, including one or more of the above-emphasized features and method steps.

Applicant's claim 17 recites:

> A single pass progressive dot printing ink-jet process comprising the steps of:
>
> applying a first UV curable ink drop to a substrate; and
>
> applying a second UV curable ink drop on to the first UV curable ink drop without intermediate solidification of the first UV curable ink drop,
>
> wherein subsequent UV curable ink drops are applied sequentially to the combined first and second UV curable ink drops without intermediate solidification of the first and second UV curable ink drops,
>
> wherein **a surface tension of the first to a last UV curable ink drop applied varies in a graduated manner within a range of from 20 up to 40 dynes/cm or a range of from 40 down to 20 dynes/cm**.

Applicant's claims 9 and 20 recite features and/or method steps that are similar to the features and method steps recited in Applicant's claim 17, including the above-emphasized features and method steps.

The Examiner alleged that Young teaches a set of UV curable inks and a method of printing with the UV curable inks "wherein the first and second UV curable ink drops have a different viscosity, surface tension or curing speed (Figure 4; Paragraphs 0038, 0042, 0050-0052)." The Examiner relied upon Temple for the teaching of wet-on-wet printing, i.e., printing subsequent UV curable ink drops without intermediate solidification or curing of the previously printed UV curable ink drops. The Examiner further alleged that it would have been obvious to incorporate the teaching of Temple into the device of

Young for the purpose of printing a flat and smooth print surface.

Applicant respectfully disagrees that the combination of Young and Temple teaches first and second UV curable ink drops having a different viscosity, surface tension, or curing speed, as alleged by the Examiner.

Young does not teach or suggest that the first and second UV curable ink drops have a different viscosity, surface tension, or curing speed, as alleged by the Examiner. Paragraphs [0038], [0042], and [0050] through [0052] of Young merely teach that the different inks include different photoinitiators such that each ink reacts to a different range of wavelengths of UV light. However, the different photoinitiators in the inks of Young clearly have no bearing on the viscosity or the surface tension of the inks (see, for example, page 3, line 25 through page 4, line 12 of Applicant's specification). Furthermore, different photoinitiators do not necessarily change the curing speed because photoinitiators primarily function to trigger the polymerization of the photosensitive resin in the inks. As explained in Examples 5 and 6 on pages 10 and 11 of Applicant's specification, curing speed can be changed by varying the *amount* of the photoinitiator and *synergist additives* (emphasis added).

Inherency may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. In re Oelrich, 666 F.2d 578, 581 (CCPA 1981). *See also* Ex parte Skinner, 2 USPQ2d 1788, 1789 (BPAI 1986) ("[T]he examiner must provide some evidence or scientific reasoning to establish the reasonableness of the examiner's belief that the functional limitation is an inherent characteristic of the prior art" before the burden is shifted to the applicant to disprove the inherency.). See M.P.E.P. § 2112(IV) The Examiner Must Provide Rationale or Evidence Tending to Show Inherency.

Assuming *arguendo* that the different photoinitiators disclosed by Young somehow change the curing speed of the inks, the Examiner acknowledged that Young does not teach or suggest varying the curing speed, the viscosity, or the surface tension in a *graduated manner*.

The Examiner relied upon Lin et al. to allegedly teach varying the curing speed of

a plurality of UV curable inks in a graduated manner "under certain conditions." In contrast to the Examiner's allegation, Lin et al. discloses that *a solvent based* ink (not a UV curable ink) may be formulated to have a slow curing speed or a fast curing speed. In particular, column 12, lines 5-25 of Lin et al. disclose:

> The ink jet inks of the present invention can be formulated to have **either** slow drying **or** fast drying characteristics on plain papers. The slow drying inks typically have a drying time greater than about 1 second, whereas the fast drying inks typically have a drying time of less than about 1 second…. During the printing process, a heating means, such as a heated platen, a heated drum, a heated belt, a heated lamp, a microwave dryer, or the like can be used, if desired, to heat the recording medium (substrate or sheet) at any desired printing stages such as before printing, during printing, after printing, or some combination thereof to increase ink drying rates and to avoid ink smearing and intercolor bleeding. (emphasis added)

The above passage of Lin et al. does NOT teach or suggest that some inks in a printing process should dry fast and that other inks in the same printing process should dry slowly. Since Lin et al. does not provide any further explanation of why one ink should dry faster and another ink should dry slower, Applicant respectfully submits that the Examiner is misinterpreting the teachings of Lin et al. That is, Lin et al. merely teaches that an ink may formulated to dry fast or that the ink may be formulated to dry slowly.

Furthermore, Lin et al. clearly does not teach or suggest varying the curing speed of a first ink, a second ink, and a last ink in a graduated manner such that that curing speed gradually increases or gradually decreases from the first ink to the last ink. Nor has the Examiner provided any evidence whatsoever that "certain conditions" would or could vary the curing speed of the inks of Lin et al. in a graduated manner.

Thus, the combination of Young, Temple, and Lin et al. fails to teach or suggest the feature of "a curing speed of the first to the additional UV curable ink drops applied varies in a graduated manner within a range of from 20 up to 70 m/min or a range of from 70 down to 20 m/min," as recited in Applicant's claim 1, and similarly in Applicant's

claims 9, 18, and 21.

The Examiner relied upon Onishi et al. to allegedly teach varying the viscosity of a plurality of UV curable inks in a graduated manner "under certain conditions." However, paragraph [0096] of Onishi et al., upon which the Examiner relied for this alleged teaching, only teaches that the viscosity of *a single ink* should be within a particular range. Paragraph [0096] of Onishi et al. discloses:

> [0096] Also, as the properties of **the ink**, for assuring the stable jetting from a head and stable supplying of ink to the heat, it is better that the viscosity is not more than 50 mPa's and more preferably not more than 20 mPa's. (emphasis added)

Onishi et al. does NOT teach or suggest varying the viscosity of a first ink, a second ink, and a last ink in a graduated manner such that that viscosity gradually increases or gradually decreases from the first ink to the last ink. Furthermore, the Examiner has failed to provide any evidence whatsoever that "certain conditions" would or could vary the viscosity of the inks of Onishi et al. in a graduated manner.

Thus, the combination of Young, Temple, and Onishi et al. fails to teach or suggest the feature of "a viscosity of the first to the additional UV curable ink drops applied varies in a graduated manner within a range of from 10 up to 30 mPa·s or a range of from 30 down to 10 mPa·s," as recited in Applicant's claim 1, and similarly in Applicant's claims 9, 16, and 19.

The Examiner relied upon Kasperchik et al. to allegedly teach varying the surface tension of a plurality of UV curable inks in a graduated manner "under certain conditions." However, column 15, lines 13-15 of Kasperchik et al., upon which the Examiner relied for this alleged teaching, only teaches that the surface tension of *a single ink* should be within a particular range. Column 15, lines 13-15 of Kasperchik et al. disclose:

> Further, the surface tension of **the ink** should be kept between about 20-40 dynes per centimeter, with a preferred value of 29 dynes per centimeter.

(emphasis added)

Kasperchik et al. does NOT remotely teach or suggest varying the surface tension of a first ink, a second ink, and a last ink in a graduated manner such that that surface tension gradually increases or gradually decreases from the first ink to the last ink. Furthermore, the Examiner has failed to provide any evidence whatsoever that "certain conditions" would or could vary the surface tension of the inks of Kasperchik et al. in a graduated manner.

Thus, the combination of Young, Temple, and Kasperchik et al. fails to teach or suggest the feature of "a surface tension of the first to a last UV curable ink drop applied varies in a graduated manner within a range of from 20 up to 40 dynes/cm or a range of from 40 down to 20 dynes/cm," as recited in Applicant's claim 17, and similarly in Applicant's claims 9 and 20.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claim 9 under 35 U.S.C. § 102(b) as being anticipated by Young; the rejection of claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Young in view of Temple; the rejection of claim 16 under 35 U.S.C. § 103(a) as being unpatentable over Young and Temple in view of Onishi et al.; the rejection of claim 17 under 35 U.S.C. § 103(a) as being unpatentable over Young and Temple in view of Kasperchik et al.; the rejection of claim 18 under 35 U.S.C. § 103(a) as being unpatentable over Young and Temple in view of Lin et al.; the rejection of claim 19 under 35 U.S.C. § 103(a) as being unpatentable over Young in view of Onishi et al.; the rejection of claim 20 under 35 U.S.C. § 103(a) as being unpatentable over Young in view of Kasperchik et al.; and the rejection of claim 21 under 35 U.S.C. § 103(a) as being unpatentable over Young in view of Lin et al.

Accordingly, Applicant respectfully submits that Young, Temple, Onishi et al., Kasperchik et al., and Lin et al., applied alone or in combination, fail to teach or suggest the unique features and method steps recited in Applicant's claims 1, 9, and 16-21.

In view of the foregoing amendments and remarks, Applicant respectfully submits

that claims 1, 9, and 16-21 are allowable. Claims 3-5, 7, 10, 14, 22-24, and 25-28 depend upon claims 1, 9, and 16-21 and are therefore allowable for at least the reasons that claims 1, 9, and 16-21 are allowable.

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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